

Correlation and Causation transcript

Animation: A green man and a blue man appear. Blue man shrugs.

Blue man: I'm very confused about the difference between correlation and causation. Can you help me?

Green man: This is a common problem; many people are not sure about the difference.

Green man: Both terms describe a relationship between two variables.

Green man: To explain what we mean by a relationship, think about what happens to your income if you get paid by the hour. The more hours you work, the more you get paid. There is a relationship between the two variables "hours worked" and "income".

Animation: A simple line graph appears, x-axis labelled "Hours Worked". The y-axis is labelled "\$ Income". A yellow arrow appears at the intersection and grows upwards at a 45 degree angle.

Blue man: I understand. So is this correlation?

Green man: Yes. In the example, when hours increases the income also changes by a consistent amount. This means that there is a correlation between hours and income. Correlation can also mean a relationship where the values move in different directions.

Animation: Blue man scratching his head in confusion

Blue man: Umm..??

Green man: Think about what would happen if the price of something that you like to drink goes up, would you buy more or less drinks during a week?

Blue man: I would probably buy less.

Green man: So, if the price keeps going up, would you keep reducing the amount that you buy?

Animation: A line graph appears with "\$ price" on the x-axis and "quantity" on the y-axis. An arrow appears starting at the top of the y axis and goes down at a 45 degree angle until it meets the x-axis.

Blue man: While my income remains the same, then yes I would.

Green man: There is a correlation, but in this situation the relationship is negative.

Blue man: OK, I understand that. Does this mean that if the variables are correlated that a change in one causes a change in the other?

Green man: Not necessarily. This is where a lot of people get confused. When a change in one is the cause of the change in the other, this is known as causation.

Green man: Think about being outside in the sun without a hat or shirt or any sunscreen. In this case, the two variables are exposure to UV rays (i.e. the sun) and sunburn of unprotected skin.

The longer you are in the sun the worse your sunburn will become. There is a direct causal relationship between being in the sun and getting sunburnt.

Animation: The image changes and a man is shown standing in the direct line of the sun. A clock is shown with the hands rapidly moving. The man turns progressively redder.

Green man: To establish if there is a cause and effect relationship often requires extensive studies and investigation.

Blue man: So I need to be careful when I hear about two variables being correlated that I do not automatically assume that the change in one caused the change in the other. Thank you.

Animation: End.